MARSHALL STAR

Vol. 39 / Num. 19 | Marshall Space Flight Center | January 20, 1999

Team conducts dry run of Chandra X-ray observatory launch

by John Bryk

While NASA's newest space telescope, the Chandra X-ray Observatory, was unveiled during a ceremony last Thursday in Southern California, the team that will launch and operate it participated in a major simulation of liftoff and deployment from consoles in Northern California, Alabama, Texas and Massachusetts.

The Marshall Center manages the Chandra observatory program for NASA.

The simulation allowed team members to practice communications and observatory operations procedures in preparation for the launch of Chandra aboard the Space Shuttle Columbia. This was the

*See **Chandra observatory** on page 5*

Photo courtesy of TRW

Technicians at TRW in Redondo Beach, Calif., prepare NASA's Chandra X-ray Observatory for an official unveiling Jan. 14. The Chandra X-ray Observatory, the world's most powerful X-ray telescope, was assembled by TRW for the Marshall Center.

NASA photo by Terry Leibold

Microgravity Development Lab at Center dedicated

Marshall Center Deputy Director Carolyn Griner and Dr. Brad Carpenter, acting director for the Microgravity Research Program at NASA Headquarters, prepare to cut the ribbon at the ceremony dedicating the Microgravity Development Laboratory at Marshall last Friday. From left, front row, are Madison Mayor Chuck Yancura; Carpenter; Griner; Microgravity Research Program Office Manager Joel Kearns; and Angela Culvert, field representative for Sen. Jeff Sessions. Back row, from left, are Dick Haiti, Huntsville City Council member; Dr. Ron Greenwood, vice president for research at the University of Alabama in Huntsville (UAH); Howell Lee, of Rep. Bud Cramer's office; and UAH President Dr. Frank Franz.

Researchers to gather at Marshall to discuss results from STS-87 mission

by Bob Thompson

Computers, infrared detectors, superalloys and gasoline products may all be improved by results from experiments conducted aboard the Space Shuttle Columbia last December.

From universities and NASA centers across the United States, researchers will gather Friday at the Marshall Center to discuss results from the fourth flight of the U.S. Microgravity Payload. This 16-day Space Shuttle mission focused on scientific investigations potentially important to industry and the economy.

Seven major experiment payloads were managed by NASA's Microgravity Research Program at Marshall. By studying how materials form, fuels burn and how liquids and gases perform in low-gravity, investigators from around the country are gaining new understanding of industrial processes which may be used to manufacture better products for industry and the home.

Mission Manager Sherwood Anderson

*See **USMP-4** on page 5*

"Believe in safety"

Safety slogan submitted by
Betty Canstrari, PD04

Microgravity Flight Planning manager Jarrett to lead Discovery Program

David Jarrett, manager of the Flight Planning and Requirements Integration Office of the Microgravity Research Program at the Marshall Center has been selected to lead NASA's Discovery Program at the Jet Propulsion Laboratory in Pasadena, Calif.

David Jarrett

The Discovery Program is among NASA's lead efforts to implement a less costly and a faster approach to solar system exploration. The program is managed by the NASA Management Office at the Jet Propulsion Laboratory for the Office of Space Science at NASA Headquarters in Washington, D.C.

"I'm excited about the new challenges ahead in the Discovery Program and am thankful for the opportunity to have worked with the fantastic people of the Microgravity Research Program here at Marshall and across the agency," Jarrett said.

Prior to joining NASA Headquarters in 1990 as the program manager for Spacelab and shuttle attached science payloads, Jarrett was a spacecraft systems engineer in the Mars Observer and Magellan projects at the Jet Propulsion Laboratory. He joined the Microgravity Research Program at Marshall in early 1997. Jarrett is a graduate of Massachusetts Institute of Technology in Cambridge, Mass., and is a native of Allentown, Pa.

Three Marshall Center employees selected for NASA fellowships

NASA Headquarters has announced the selections for the 1999-2000 NASA Fellowship Programs. Marshall received three of the 25 selections agency wide. Those selected were Kenneth R. Fernandez, Exploration Transportation Office, for the Massachusetts Institute of Technology Center for Advanced Educational Studies; Audrey Robinson, Office of Chief Counsel, for the Smith College Critical Issues Program for Women Managers; and Tereasa Washington, Customer and Employee Relations Directorate, for the Harvard University Senior Managers in Government Program.

The NASA Fellowships are highly competitive with selection criteria including the candidate's work experience and leadership ability. Selection is determined by paper reviews of the candidate's application as well as personal interviews with the selection panel members.

Marshall's Quality Management System to undergo audit

On February 22-24, National Quality Assurance will audit the Marshall Center's Quality Management System (QMS). This audit is another in a series of external surveillance audits by Marshall's external registrar to assess the health of the Quality Management System.

At a Marshall Quality Council meeting Dec. 29, Marshall Center Director Art Stephenson announced the appointment of Center Associate Director Sid Saucier as Marshall's ISO management representative. Saucier assumes the authority and responsibility for implementation and maintenance of the Quality Management System from Robert Schwinghamer, Marhsall's associate director, technical, who retired Jan. 3.

"It is our continuing policy to provide quality products and services to our customers," said Saucier. "Marshall people are inherently quality conscious in everything they do, so the policy fits us well."

Marshall management responsibilities include defining, documenting and implementing the Quality Management System with regular reviews by the Marshall Quality Council.

The audit and the ongoing organizational self-assessments, each focus on six specific elements: management responsibility; design control; inspection, measuring and test equipment; control of nonconforming product; internal quality audits; and corrective and preventative action.

Design control is accomplished by establishing and maintaining documented procedures to control and verify the design of the product or service to ensure conformance to specified requirements. Quality Management System documents address design control, configuration management and payload safety. These documents guide project management teams to develop and control design of the hardware and software through project plan documentation and design reviews. Additionally, specific Marshall handbooks and standards are key to the design process and output, and safety considerations are always addressed.

The National Quality Assurance audit marks the one-year anniversary of Marshall's ISO 9001 certification.

"Our quality system is 'world class' and success in this audit is critical to maintaining this stature," Saucier said. More audit-specific information, including sample questions, about these six elements may be found on the Center's ISO home page at the following Web site:
http://iso9000.msfc.nasa.gov:9001/index.html

Mandatory security briefings continue at Center

As a part of an on-going federal workplace security program, the Protective Services Office at the Marshall Center will conduct a series of security awareness and education briefings this month in Morris Auditorium. All Center and on-site contractor personnel are required to attend one of the sessions. Seating will be on a first-come, first-served basis. The one-hour briefing will be given at 8:30, 10 a.m., 1:30 and 3 p.m. Jan. 20, 25 and 26.

CAPER sounding rocket to study Earth's upper atmosphere

by Tracy McMahan

A NASA sounding rocket is poised for launch this month to carry a suite of sophisticated instruments into a polar region of Earth's upper atmosphere, a region that is difficult to study any other way.

CAPER — the Cleft Accelerated Plasma Experiment Rocket — is scheduled to be launched between now and Jan. 25 from Norway. CAPER will fly into an area where it is directly exposed to the solar wind — energetic solar particles that sometimes affect our everyday lives by disrupting satellite communications and power grid operations.

"The region of the atmosphere where CAPER is headed is the only place where the solar wind can directly enter Earth's atmosphere," said Victoria Coffey, a scientist at the Marshall Center. Coffey is currently in Andoya, Norway, preparing CAPER for launch.

The exact launch date will be set when NASA's Polar space weather satellite indicates conditions are just right for studying the solar wind and how it interacts with Earth's upper atmosphere. The CAPER instruments are more sensitive than those used on prior sounding rockets and will measure conditions at altitudes lower than those sampled by Polar and other space weather satellites. CAPER's instruments, developed by a team of U.S. scientists from NASA and several universities, will probe a "fountain" of ions that flows continuously into space.

An artist's concept depicts the planned trajectory of CAPER from Andoya, Norway, to the polar ice cap.

"The main question we want to study is how do these very low-energy particles defy gravity and get to those altitudes?" said Coffey.

Scientists theorize that instabilities in the electrical current flowing into Earth's uppermost atmosphere energize the ions, giving them the ability to travel to higher altitudes. The information collected by CAPER will help determine if this is true or if other phenomena are responsible.

When CAPER is launched, a Black Brant XII sounding rocket will rifle skyward to ensure the CAPER payload arcs along the Earth's magnetic field lines. The instruments will deploy, and data will be relayed to receiving stations at Andoya. The flight will last less than 30 minutes. Information collected by the instruments will be distributed to scientists for analysis.

Coffey works with Dr. Michael Chandler, the lead CAPER scientist at Marshall's Space Sciences Laboratory. A team of scientists from Goddard Space Flight Center in Greenbelt, Md., and several universities are partners with the Marshall Center on the project. More information on the CAPER project and updates on its launch may be found on the Marshall Space Sciences Laboratory Web site at: http://www.science.nasa.gov

NASA photo by Emmett Given

Center Director Stephenson awards commendations

Marshall Center Director Art Stephenson, center, awards Director Commendations to Debi Bradford of WAAY-TV and Officer Paul Ballance of the Huntsville Police Department. Bradford and Ballance were recognized for their outstanding help in organization, planning and traffic control during the STS-95 crew visit Dec. 15.

Allison reassigned to Center Operations Directorate at Marshall

Paul Allison has been reassigned to the Center Operations Directorate at the Marshall Center. In addition to serving as Marshall's Chief Information Officer, Allison also will be responsible for a centerwide Information Technology focus at Marshall. The focus includes computer workstations, file servers and data networks, the Internet, and a multitude of information data streams into and out of the Center.

Paul Allison

NASA hurricane study reveals intriguing results

by Kelly McFalls

NASA and other weather researchers have learned "intriguing" new information about upper-level winds that drive hurricanes, and the devastating impact of the storms as they collide with mountains.

The research from a seven-week study last summer, called the Third Convection and Moisture Experiment (CAMEX-3), involved NASA, the National Oceanic and Atmospheric Administration and several universities in a concentrated effort to gauge the strength of Atlantic hurricane winds and rainfall.

"The wind patterns flowing into and out of the hurricanes at the upper altitudes were much more complicated than had been anticipated," said the lead mission scientist, Robbie Hood of the Marshall Center. "At times, strong wind gusts were recorded at positions farther from the eyewall or with magnitudes greater than expected."

Researchers flew aboard NASA's specially equipped DC-8 jetliner into 1998 hurricanes Bonnie, Danielle, Earl and Georges. An instrument-laden ER-2 high-altitude aircraft was flown above the hurricanes to collect first-of-its-kind data. The information is expected to assist weather forecasters to better predict storm strength and direction — saving lives and reducing evacuation zones along coastal areas.

"The multi-aircraft datasets obtained by NASA aircraft in these hurricanes are unprecedented in their comprehensiveness," said Dr. Ed Zipser, a weather expert from Texas A&M University in College Station, Texas. "They will provide researchers with the raw material to understand the storms and their environment, and lead to improved track and intensity forecasts in the future."

"The amazing thing about this data from Georges is that the rain was enhanced significantly by the mountains in the interior of the Dominican Republic," said NASA researcher Dr. Gerald Heymsfield from the Goddard Space Flight Center in Greenbelt, Md. "We got a glimpse of the storm's impact with the mountainous island and the subsequent rain which eventually caused significant loss of life."

*See **Hurricane study** on page 5*

Center's Legal Office assists with patent applications

by Lisa Hughes

The Legal Office at the Marshall Center submitted a record-breaking 36 patent applications to the Patent and Trademark Office in Washington, D.C., during 1998. This achievement reflects the innovative, and cutting-edge technology submitted largely by Marshall engineers, scientists and support contractors.

"The majority of the applications filed came from work being done right here at Marshall," said Bob Broad, chief patent counsel for Marshall. "Our office is making a conscious effort to visit the labs and encourage submissions of new technology. These visits will continue throughout the year."

The patent team at Marshall reviewed existing cases, reevaluating patent potential. With the backlog now up-to-date, new disclosures are needed to file patent applications.

"The inventor is our customer and we are here to help in any way possible," said Broad. "1998 was an exciting year, and we hope to continue the momentum throughout 1999."

To submit a disclosure of technology and software, the innovator must fill out NASA form 1679, Disclosure of Invention and New Technology (including Software). The form may be accessed electronically and completed on-line using the PerForm Pro application in centerwide Electronic Forms, located in the DDS applications folder. PC users will find the form in the CWFORMS-Form Style [nasa] folder. Macintosh users may access the form through the MACFORMS-[nasa] folder.

Form n1679 also may be accessed electronically through a Web browser on the NASA Headquarters Electronic Forms Web site at: URL http://www.hq.nasa.gov/help/form nf.htm Choose the second n1679 form listed. Completed forms may be sent to: Susan Whitfield, CO30. If you have questions about what can be patented or want to talk to a patent attorney, call the Legal Office at Marshall at 544-0021.

NASA photo by Adeline Byford

From left, Robert Broad, patent counsel at the Marshall Center; Lisa Hughes, legal technician; and inventor Dr. Jonathon Campbell sign patent applications in Marshall's Legal Office.

Obituaries

Rorex, Beatrice Anne, 62, Huntsville, died Jan. 7. Rorex retired from the Marshall Center in 1994, where she worked as an employee development specialist. Rorex is survived by her brother, Hershel Rorex of Durham, N.C.

Upcoming Events

Marshall Association kick-off meeting Jan. 26

The Marshall Association's 1999 kick-off meeting is set for 11:30 a.m. Jan. 26 in the Bldg. 4203 cafeteria. Speaker Dr. Dan Carter, New Century Pharmaceutical, Huntsville, will discuss "Making the Transition from Civil Servant to Entrepreneur." The Marshall Association also will kick off its 1999 membership drive. The association is open to all NASA employees and retirees. Ticket cost for the luncheon meeting is $7 for members and $8 for non-members. For reservations, call Efrem Hanson at 544-6340.

Alabama Music Hall of Fame induction Jan. 29

The Alabama Music Hall of Fame Eighth Induction Banquet and Awards Show will be held Jan. 29 in the South Hall of the Von Braun Center.

Five music achievers from the State of Alabama — The Temptations, Wilson Pickett, Bobby Goldsboro, David Briggs and Donna Hilley — will be inducted into the Hall of Fame.

Marshall's NASA Exchange will sell 100 reserved gallery seats at $20 each beginning Friday, Jan. 22.

Contact: Rosa Kilpatrick of Marshall's Government and Community Relations Office at 544-0042.

Hurricane study

Continued from page 4

Heymsfield's images from a Doppler radar on the high-altitude aircraft show Hurricane Georges slamming into 9,000 foot mountains — producing what appeared to be huge thunderstorms over the mountains.

"Understanding this very complicated interaction between Hurricane Georges and the mountains will keep us busy for a while," said Heymsfield.

The two NASA aircraft were flown a combined total of 132 hours to sample various aspects of the hurricane environment. Information from three storms was captured while they made landfall. The hurricane team also utilized ground-based instruments on Andros Island, Bahamas. The instruments monitored the daily tropical environment before and after each storm.

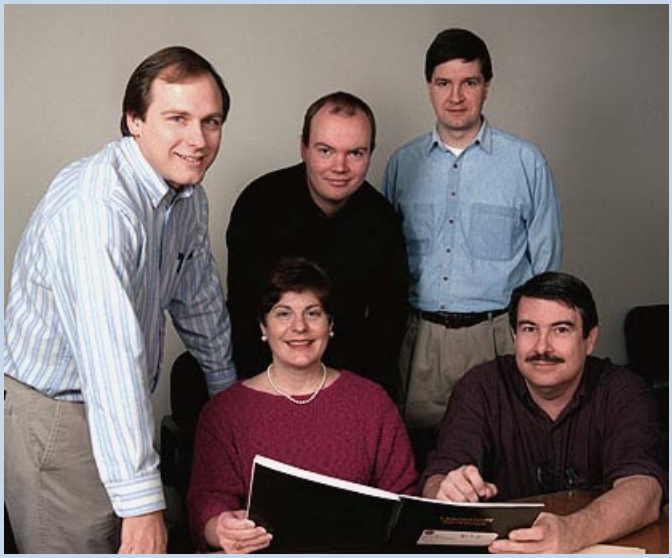
USMP-4

Continued from page 1

of the Marshall Center described the scientific mission of the fourth U.S. Microgravity Payload as "a grand success."

"The greatest value of this research is the foundation it builds for the future," said Anderson. "It is pure research, the benefits of which will be a gift to our children and grandchildren — just as transistors and lasers were gifts to us from our fathers and grandfathers."

More information about Microgravity Research Program experiments may be found at the following Web site: http://microgravity.msfc.nasa.gov/MICROGRAVITY/



NASA photo by Adeline Byford

Marshall scientists selected to receive grants

As part of NASA's Biotechnology Program, 48 researchers have been selected as grant recipients to study protein crystallization and cell science. Grant recipients from the Marshall Center include, from left, seated, Laurel Karr, ES76; and Marc Pusey, ES76. Standing from left are Craig Kundrot, ES76; Edward Snell, National Research Council; and Russell Judge, University of Alabama in Huntsville. The research, managed by Marshall's Microgravity Research Program, may result in improvements in structure-based drug design, tissue engineering and biosensor development.

Chandra observatory

Continued from page 1

second of five scheduled joint integrated simulations, and the first to involve the entire launch and operations team.

Controllers and managers from the Marshall Center; Chandra's prime contractor, TRW, in Redondo Beach, Calif.; and the Chandra Science Center, Cambridge, Mass., participated from the observatory control center also in Cambridge, and the Huntsville Operations Support Center at Marshall.

Additionally, Shuttle crew members and mission controllers participated from the Johnson Space Center in Houston, and Inertial Upper Stage controllers participated from Onizuka Air Force Station in Sunnyvale, Calif.

The groups monitored data from many events. These events included a simulated launch, deployment from the Shuttle, and Inertial Upper Stage firings that will help boost the observatory to a higher orbit. The exercise challenged controllers and managers by presenting a variety of situations and problems to test the team's ability to effectively and rapidly solve them.

The Chandra X-ray Observatory, formerly called the Advanced X-ray Astrophysics Facility, is the world's most powerful X-ray telescope. Scientists believe its ability to see previously invisible black holes and high-temperature gas clouds give the observatory the potential to rewrite the books on the structure and evolution of our universe.

Employee Ads

Miscellaneous

★ Tow hitch for Jeep Cherokee. 922-5727
★ Six shopping carts, $10 each. 837-0035
★ CIV2 Strategy guide, $6; Cardinal 700 ISA SVGA IMP, $6; four 256K SIMMS, $1 each. 721-0617
★ Flexible drain pipe, approximately 90 feet, 4-inch diameter w/downspout adapter, $15. 534-2368
★ Cowboy boots, tan and navy, size 10-1/2D, $45. 851-7406
★ Pentium 75MHz equivalent PC, 1.0G, 32Mbyte RAM, 33.6 modem, 14" SVGA monitor, $350. 464-9352
★ Faberware indoor grill/rotisserie, 10" x 15-l/2" cooking surface, stainless steel, shish kabob accessory, $50. 883-0313

Vehicles

★ 1993 Nissan 240SX, 71K miles, automatic, $7,000 o.b.o. 771-2002
★ 1997 ChevyZ71 truck, 4-wheel drive, extended cab, white w/burgundy interior, 20K miles, $22,800. 423-5734 days or evenings
★ 1996 Pontiac Transport, 7/8 passenger, PDL/PW, $10,500. 772-7842
★ 1988 Honda Accord LXi, 145K miles, $4,900 o.b.o. 751-0682
★ 1994 Honda Civic EX, 4-dr., $8,250. 852-0666
★ 1994 Nissan Quest GXE, 96K miles, PW/seats/sunroof, tow pkg., alloy wheels, $13,700. 773-4461
★ 1995 Buick Riviera, $15,000 o.b.o.; 1985 Dodge Ram Charger, $5,000 o.b.o. 828-5289
★ 1997 Nissan Maxima SE, 5-spd., Bose CD, $16,875 o.b.o. 851-2929

Free

★ Dive suit top, fits short waist, 170 pounds; movie screen, portable. 864-0155
★ Used Beta size video cassettes. 881-6595

Wanted

★ Ride to work, 7 or 7:30 a.m. shift, Governors Drive/Huntsville Hospital area, will pay $6 per day. 534-5398
★ Randix or PAO storage bins for storing 24 VHS cassettes. 881-6595
★ Grain mill. 837-0085

Center Announcements

☛ ***MESA*** **—** The Marshall Engineers & Scientists Association (MESA) will hold a meeting at 11:30 a.m. Thursday in Bldg. 4471, room C-105.

☛ ***MOO*** **—** The Management Operations Office (MOO) retirees will meet for breakfast/lunch at 10 a.m., Thursday, Jan. 28 at the Cracker barrel in Madison. All present or former MOO employees and retirees are invited. **Contact:** 539-0042

☛ ***Shuttle Buddies*** **—** The Shuttle Buddies will meet for breakfast at 9:15 a.m., Monday, Jan. 25 at Shoney's on University Drive West. **Contact:** Deemer Self, 881-7757

☛ ***Rollout training available*** **—** The Employee and Organizational Development Center at Marshall is offering several NPG 7120.5a Rollout training classes. The course is designed to familiarize program and project personnel with the new NASA Program/Project Management Process and reinforce top-level rollout strategy originally presented Nov. 9 at Marshall. The 12-hour class is limited to 25 and employees may register via AdminSTAR. A training request form is not required. Training dates are Jan. 26-27, 28-29, March 9-10, and 11-12. C**ontact** Stephanie Elliott at 544-7553 or Renee Higgins at 544-8864.

☛ ***MARS Ballroom Dance Club*** **—** The MARS Ballroom Dance Club will offer mambo and waltz lessons 7-8 p.m. Jan. 18 and 25. Classes will be held in the Parish Hall of St. Stephen's Episcopal Church at 8020 Whitesburg Drive. These lessons are available to MARS Ballroom Dance Club Members and partners/guests at $6 per person. **Contact:** Pat Sage at 544-5427.

☛ ***NASA Alumni League Dinner*** **—** A NASA Alumni League Dinner will be held Thursday, Jan. 21 at the Holiday Inn-Madison Square. Marshall Center Director Art Stephenson will speak. A social will begin at 6:30 p.m., followed by dinner at 7:30 p.m. Ticket cost is $16 and payable by check to: **NASA Alumni League/MSFC Chapter**, c/o Ed Buckbee, 811 Esslinger Road, Huntsville, AL 35802. **Contact:** Ed Buckbee at 881-9622.

☛ ***Space-related talk*** **—** "The Artemis Project — A Private Trip to the Moon" will be discussed 7-8:30 p.m., Wednesday, Jan. 27 at the Huntsville-Madison County Public Library auditorium, 915 Monroe St., Huntsville. Boise Pearson, president of the Artemis Society International, will speak at the event sponsored by the Huntsville L5 Society. The event is free and open to the public. **Contact:** Ronnie Lajoie at 971-3055 or 721-1083

☛ ***Toastmasters*** **—** The NASA Lunar Nooners Toastmasters Club will meet at 11:30 a.m., Tuesday, Jan. 26 in the Bldg. 4610 cafeteria conference room. All Marshall employees, contractors and friends are invited. **Contact:** Lee Johns, 544-5241

MARSHALL STAR

Marshall Space Flight Center, Alabama 35812
(256) 544-0030

The Marshall Star is published every Wednesday by the Internal Relations and Communications Office at the George C. Marshall Space Flight Center, National Aeronautics and Space Administration. Contributions should be submitted no later than Friday noon to the Marshall Internal Relations and Communications Office (CO40), Bldg. 4200, room 101. Submissions should be written legibly and include the originator's name. Send electronic mail submissions to: ann.bryk@msfc.nasa.gov The Marshall Star does not publish commercial advertising of any kind.

Director of Internal Relations
and Communications — Norman Brown
Managing Editor — Angela D. Storey
Writer-Editor — Ann Marie Bryk

NASA at Marshall Space Flight Center may be found at the following Web site: http://www.msfc.nasa.gov

U.S. Government Printing Office 1999-733-111-80043

BULK RATE
Postage & Fees PAID
NASA
Permit No. G-27